



PATRICK J. HUDSON, Ph.D., P.E.
SENIOR MANAGING CONSULTANT

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Dr. Hudson has over 35 years of experience in naval architecture and ocean engineering, including vessel design and repair, waterfront condition assessment, and failure analysis. He has testified as a maritime expert in both Federal and State courts and International Arbitrations. He specializes in marine vessels, floating structures, and waterfront infrastructure such as ports, harbors, piers, seawalls, and breakwaters. Dr. Hudson applies his expertise to the investigation and analysis of naval and commercial vessels, recreational boats, ship repair, marine cranes, marine terminals and facilities, coastal engineering, subsea cables, industrial diving operations, and marine workplace safety. His project experience includes reconstruction of commercial and recreational vessel accidents, analysis of vessel allisions and collisions, vessel grounding and sinking, stability analysis of vessels and barges, ship cargo securement and damage, seawalls, and operations related to drydocks and ship repair facilities. He has investigated marinas, residential and commercial piers and docks, vessel moorings and marine anchor systems, underwater vehicles, and waterfront construction. Dr. Hudson also has intellectual property experience and has testified in multiple patent disputes.

Dr. Hudson is a retired Commander and Engineering Duty Officer in the U.S. Navy, having served for a combined 26 years of active and reserve duty. His most recent service included several years in the Navy's ship repair and salvage communities, where he focused on heavy lift and drydocking of damaged vessels. He was an Assistant Professor of Naval Architecture and Ocean Engineering at the United States Naval Academy, as well as Lecturer at the Johns Hopkins University and Virginia Tech, where he taught undergraduate and graduate-level university courses in naval architecture, marine propulsion, ports & harbors, and offshore and coastal engineering.

While serving in the U.S. Navy, Dr. Hudson participated in multiple marine salvage operations, including the recovery of the turret from the Civil War ironclad U.S.S. Monitor in North Carolina and relocation of the wreck and recovery of bodies from the Japanese Fisheries Training Vessel Ehime Maru off of Hawaii. He supervised construction and repair of vessels in shipyards and floating drydocks, observed the onload and offload of naval vessels aboard float-on/float-off heavy lift ships, and conducted regular inspections of floating drydocks and graving docks. During his time with the Navy Seabees, he managed several naval facility construction projects, including landing and termination of submerged acoustic surveillance cables, construction of a ten-story residential tower, construction of a new security building, modernization of a sewage lift station, road paving, and installation of underground and above-ground utilities.

As a civilian naval architect, Dr. Hudson worked for over 20 years in the design, evaluation, modification, and repair of both naval and commercial vessels, including aircraft carriers,

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submarines, amphibious assault ships, cruisers, destroyers, oceanographic research vessels, and ferries. Major design programs included the CVX (later CVN-78) next generation aircraft carrier, the Virginia Class attack submarine, and the DDG-1000 destroyer. Dr. Hudson also served as the Deputy Technical Director of the Navy's Center for Innovation in Ship Design.

Areas of Specialization

Cargo Transportation
Construction Defects
Design Analysis
Intellectual Property
Marine
Pipelines
Recreational Products
Safety

Education

Master of Legal Studies, Sandra Day O'Connor College of Law, ASU, 2022
Ph.D., Ocean Engineering, Johns Hopkins University, 2002
M.S. Eng., Civil Engineering, Johns Hopkins University, 2001
B.S., Naval Architecture, United States Naval Academy, 1989

Registration and Certifications

Professional Engineer (Mechanical) in State of California (License no. M 38178)
Professional Engineer in State of Maryland (License no. 31148)
Professional Engineer in Commonwealth of Virginia (License no. 024913)
Professional Engineer in State of Texas (License no. 128035)

Honors/Awards

Tau Beta Pi Engineering Honor Society
Meritorious Service Medal
Navy Commendation Medal
RADM Stephen Israel Technical Leadership Award (U.S. Navy)

Positions Held

Senior Managing Engineer, Exponent, Inc. 2021 – 2024
Practice Leader, Marine, Envista Forensics, 2019 – 2021
National Division Manager, Marine Division, Rimkus Consulting Group, Inc., 2017 – 2019
District Manager / Forensic Engineer, Unified Investigations & Sciences, Inc., 2015 – 2017
Head, Naval Architecture Branch, Southwest Regional Maintenance Center, U.S. Navy,
2015 – 2016

Commander (O-5), Engineering Duty, U.S. Navy Reserve, Naval Sea Systems Command (NAVSEA), U.S. Navy, 1995 – 2015
Senior Naval Architect (GS-15), Carderock Division, Naval Surface Warfare Center, U.S. Navy, 2009 – 2015
President and Principal Naval Architect, Moment Engineering, Inc., 2008 – 2015
Mechanical Systems Supervisor, ISR Sensors Group, Johns Hopkins University Applied Physics Laboratory, 2001 – 2009
Senior Naval Architect (GS-12). Carderock Division, Naval Surface Warfare Center, U.S. Navy, 1996 – 2001
Project Naval Architect, John J. McMullen Associates, Inc., 1993 – 1996
Flag Lieutenant / Aide to the Commander, SECOND Naval Construction Brigade, U.S. Navy, 1991 – 1993
Assistant Resident Officer in Charge of Construction, Atlantic Division, Naval Facilities Engineering Command, 1989 – 1991

Professional Associations and Affiliations

American Society of Civil Engineers (ASCE)
American Society of Mechanical Engineers (ASME)
Maritime Law Association of the United States (MLAUS)
Society of Naval Architects and Marine Engineers (SNAME)

Publications

Patev, R., Consolazio, G., **Hudson, P.**, McCormick, M., Marr, W., Walker, J., & Hokens, K. (2010), Aberrant Barge Impact Loads on Hurricane and Storm Damage Risk Reduction system (HSDRRS) Floodwalls, U. S. Army Corps of Engineers, North Atlantic Division, Technical Report, March 2010.

Hudson, P. (2009) *Aground Upon the Sands: An Investigation into the Wave-Induced Migration of Grounded Ships*. VDM Verlag Dr. Müller. ISBN: 9783639139532, 3639139534.

Fredriksson, D. W., Tsukrov, I., & **Hudson, P.** (2008). Engineering Investigation of Design Procedures for Closed Containment Marine Aquaculture Systems. *Aquacultural Engineering*, 39(2-3), 91-102.

McCormick, M., & **Hudson, P.** (2008). Alternative Expression for Havelock's Free-Surface Integral. *U. S. Naval Academy, Engineering and Weapons Division, Report EW-01-08*, January 2008.

Hudson, P. J., Wilkins, J., Quinn, S., Hills, N., Wasalaski, R., & Ofosu-Apeasah, E. (2005). Overcoming Interoperability Challenges for Joint and Coalition Heavy Lift Transportation Operations. In *Proceedings of ASNE Day 2005*, American Society of Naval Engineers, Virginia Beach, Virginia, 25-27 April 2005.

- McCormick, M. E., Kraemer, D., **Hudson, P.**, & Nobel, W. (2002). Analysis of the Added Mass of a Barge in Restricted Waters. *U.S. Army Corps of Engineers, Washington, D.C., ERDC/ITL TR-02-B.*
- McCormick, M. E., & **Hudson, P. J.** (2001). An Analysis of the Motions of Grounded Ships. *International Journal of Offshore and Polar Engineering, 11(2)*, 99-105.
- Hudson, P. J.**, McCormick, M. E., & Browne, S. T. (2001), "A Low-Cost Wave-Sediment-Towing Tank," Proceedings of the Fourth International Symposium on Ocean Wave Measurement and Analysis, San Francisco, California, 3-5 September 2001.
- Hudson, P. J.** (2000), SICEM vs. ASSET: A Systematic Comparison, Naval Surface Warfare Center, Carderock Division, Report No. NSWCCD-20-TR-2000/02.
- Hudson, P. J.** (1999), Ship Integration Cost and Evaluation Model (SICEM), Naval Surface Warfare Center, Carderock Division, Report No. NSWCCD-26-TR-1999/09.

Selected Project Experience

Vessel Incidents

- Investigated the capsizing and sinking of an offshore fishing vessel in Northern California that resulted in one fatality
- Analyzed and modeled the capsizing and sinking of an open cockpit sailboat in Maryland that resulted in two fatalities
- Investigated the sinking of an electric dredge in a coal tailings pond that resulted in one fatality
- Investigated and testified regarding the capsizing of a World War 2-era floating drydock while under tow from Seattle to Ensenada, Mexico, which resulted in its sinking within the Monterey Bay Marine Sanctuary
- Analyzed the allision of a ship dragging its anchor with an anchored vessel in the Mississippi River
- Evaluated post-incident repairs required for a large commercial vessel destroyed by fire while moored alongside a pier in Mexico
- Investigated and testified about the allision of a recreational fishing boat with an oil platform off the Louisiana coast
- Analyzed a collision between a containership and a chemical tanker in the Houston Ship Channel which resulted in hull damage to both vessels
- Investigated and testified regarding alleged contamination of cargo tanks on a civilian barge by a tank cleaning company
- Determined the cause of unique hull corrosion experienced on a river excursion vessel
- Investigated a fatal personal watercraft accident in a lake where the operator drowned

Marine Infrastructure

- Conducted numerous regular evaluations of piers, wharves, aids to navigation, floating docks, and other waterfront infrastructure at U.S. Coast Guard facilities nationwide. These inspections included both above and underwater evaluations of material condition, expected remaining service life, and recommended repairs. The underwater inspections were conducted by subcontracted divers using both surface-supplied air and SCUBA diving methods. Defects and deterioration of the structures were documented and compared with the previous inspection results.
- Evaluated damage to a large petroleum pier in Panama resulting from allision by a tanker
- Assessed required repairs to a recreational marina resulting from a major fire that damaged the docks and destroyed several vessels
- Evaluated damage and required repairs to a container quay after allision from a container ship
- Investigated damage and evaluated required repairs to an inland recreational marina destroyed by a tornado in the Midwest
- Evaluated damage to a Gulf coast shipyard where two floating drydocks partially sunk during a hurricane

International Arbitration

- Conducted vessel maneuvering and port design analysis and testified in an arbitration involving a container terminal in Peru
- Testified in an international arbitration regarding alleged design defects in an underwater cooling water culvert installation in Malaysia

Intellectual Property

- Performed patent validity and infringement analysis and testified regarding alleged infringement of a patent related to an underwater laser scanning system
- Performed patent invalidity and noninfringement analysis and testified regarding alleged infringement of a patent related to an amphibious dredge